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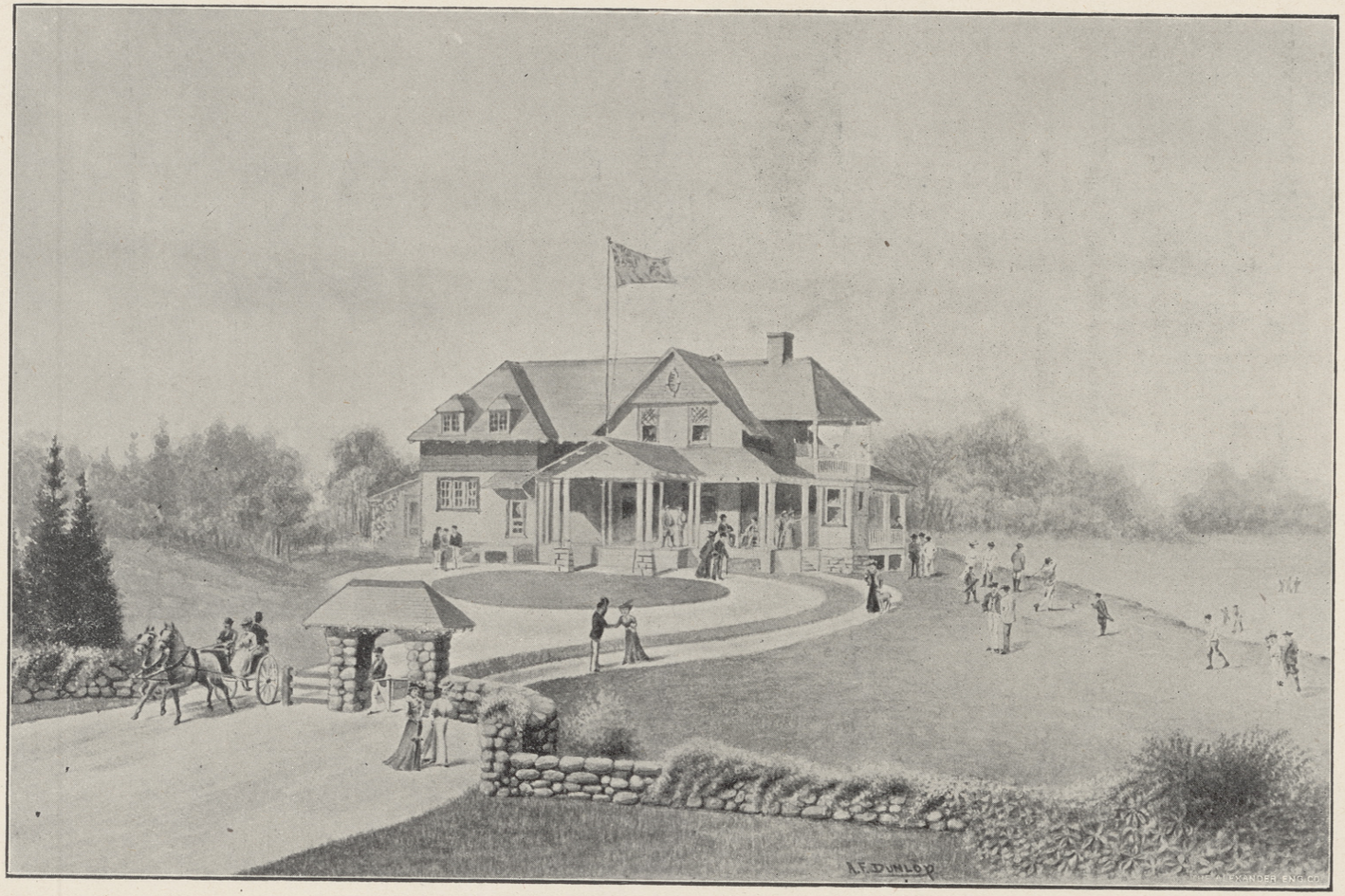
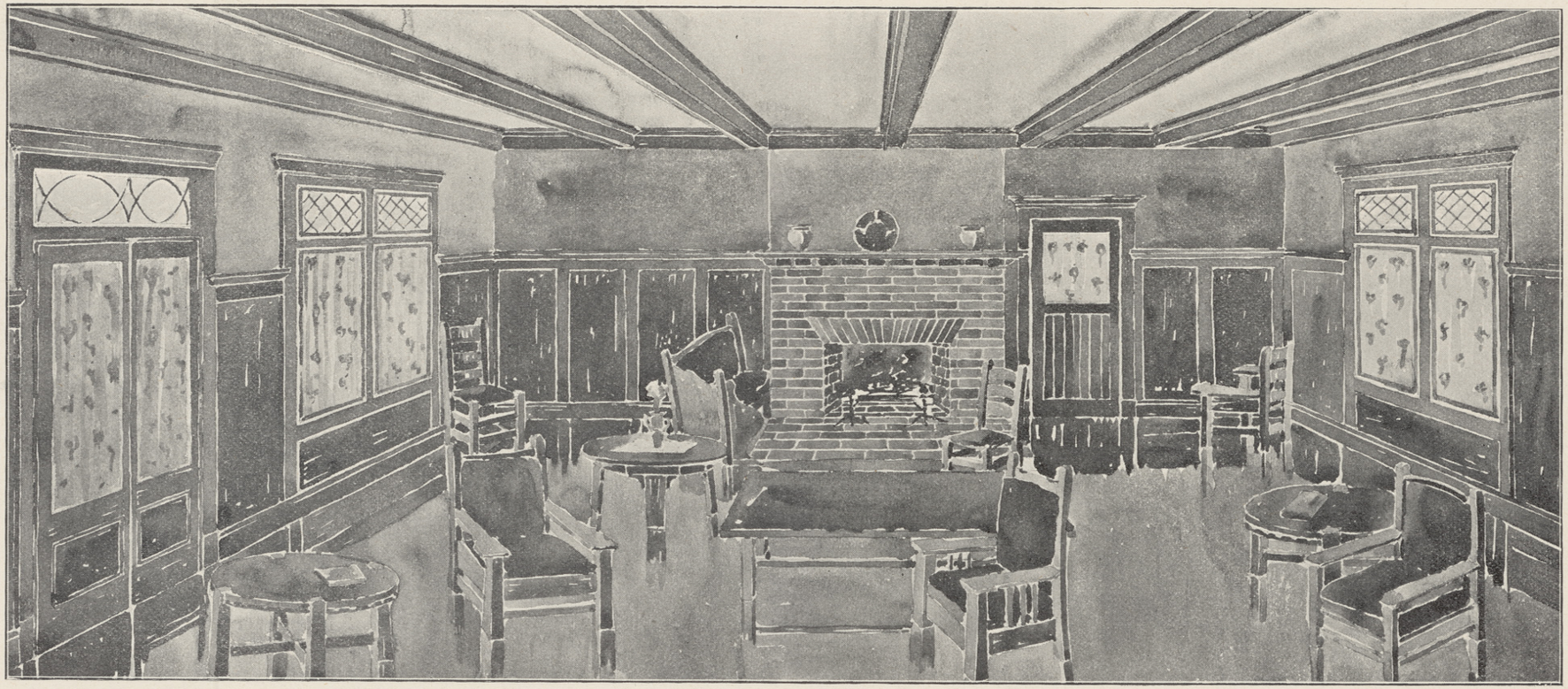


GOLF CLUB HOUSE, NEAR MONTREAL, QUE.

A. F. DUNLOP, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1903



INTERIOR OF GOLF CLUB HOUSE, NEAR MONTREAL, QUE.

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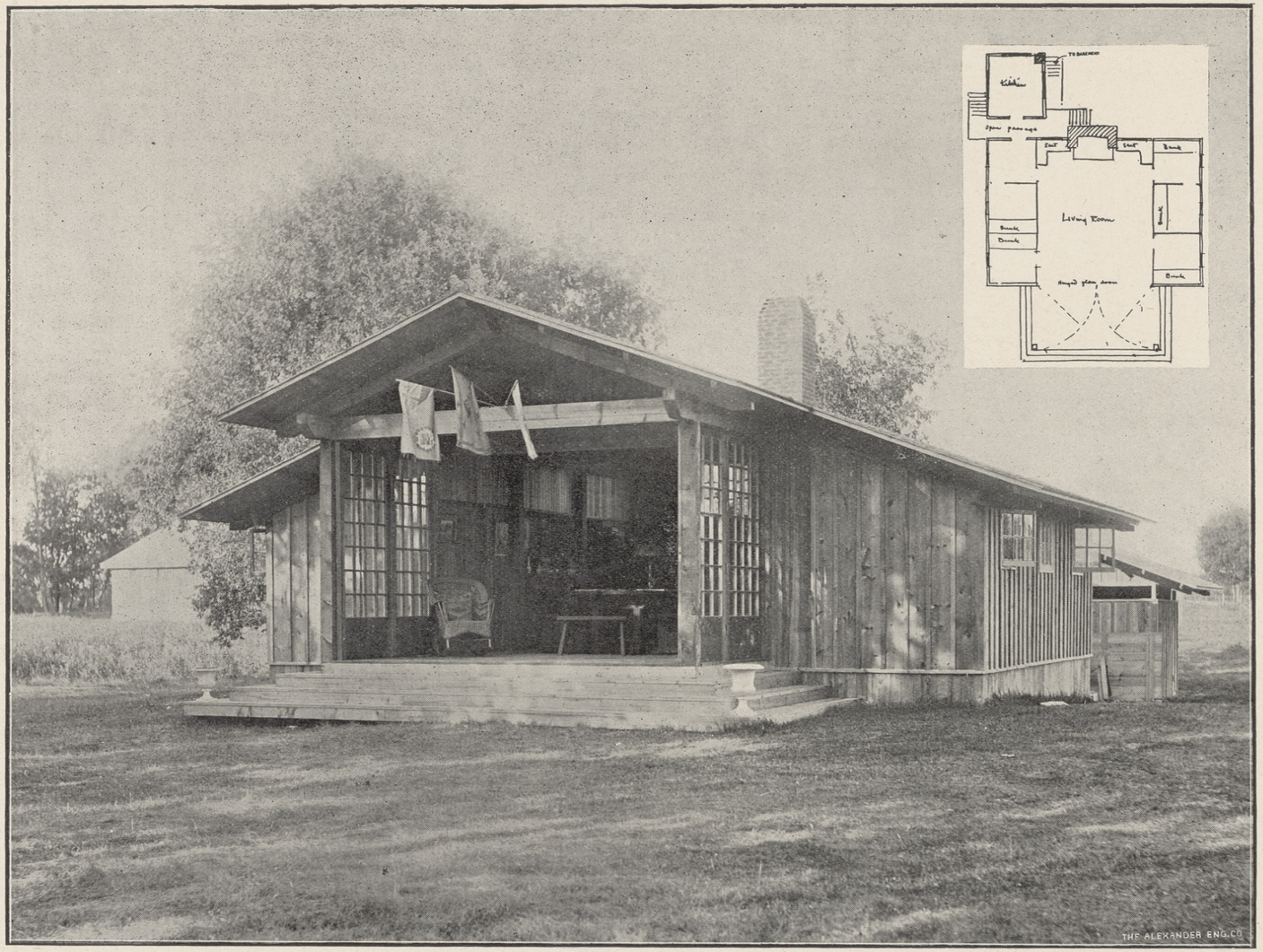

SUMMER HOUSE AT ST. JAMES, NEAR WINNIPEG.

(For description see North-West letter in this Number.)

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SEPTEMBER, 1908

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CHADWICK & BECKETT, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1908

The Canadian Architect and Builder

VOL. XVI.—No. 189. SEPTEMBER, 1903.

ILLUSTRATIONS ON SHEETS.

Golf Club House, near Montreal, Que.—A. F. Dunlop, Architect.
Summer House at St. James, near Winnipeg.
Houses, Nos. 348 and 350 Elgin Avenue, Toronto.—Chadwick & Beckett, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Entrance, No. 3 Berkeley Square, London, Eng.
Bishop's Chair, Trinity College, Toronto.—Eden Smith, Architect.

ILLUSTRATIONS IN TEXT.

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" EDMUND BURKE, " "
" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal
" W. H. ELLIOTT, Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Grand Stands.

The return of the football season should act as a reminder to architects and builders as well as municipal authorities, that the lives of many hundreds of spectators will depend on the knowledge of those who design grand stands and the honesty of those who build them. Following the disaster on the football field at Glasgow last year, comes news of the recent collapse of one of these grand stands at Perth, Scotland, resulting in serious injury to thirty persons.

Plainness in Design.

Less than two years ago we took occasion in these columns to deplore the cheap and meaningless ornament with which most of the furniture manufactured in the United States and Canada was being overloaded, and the consequent perversion of the public taste. It is gratifying to observe that in the short period that has since elapsed, there has taken place a radical change in furniture design, with the result that plainness is now the leading characteristic. The change is a most agreeable and wholesome one, and will be certain to have a beneficial effect on architectural design and furnishings. It would be interesting to learn what have been the principal causes which have brought about within so short a time so complete a revolution in popular taste.

The Commercial Congress.

The important bearing of commercial interests on national affairs and policy was well illustrated by the keen interest manifested throughout the Empire in the deliberations of the Commercial Congress held last month in Montreal. There is evinced a strong desire on the part of the various colonies and some of the leading British statesmen that the various parts of the Empire should be more firmly welded together. It is realized that one of the best means to this end is by promoting closer trade relations. A step in this direction was taken by the Commercial Congress in adopting a resolution affirming the desirability of this object and recommending the Imperial government to appoint a special commission to make thorough enquiry into the matter and make such recommendations as in its judgment might seem wise and feasible. The subject is of the highest possible importance to each constituent part of the Empire as well as to the nation as a whole. The

British government should lose no time in appointing a Commission capable and willing to give it prompt and careful consideration. The national life of the people of Canada, in all its varied relations and aspects must necessarily be largely influenced by those with whom we have most intimate trade relations. Therefore should not this question of our future trade relations possess an interest for architects, builders, and indeed citizens of every class ?

The Slate Industry.

Several years ago one of the few slate quarries then in operation in Canada, was closed down because a profitable market could not be found for the output. The Canadian market had been made a dumping ground for the product of United States quarries, for which there was not sufficient home demand, and prices were cut so close that there was no money in the business for anybody. Now the conditions are very different. The United States market largely absorbs the output of the quarries, and British importers who formerly got their supplies from that source are trying to buy in Canada. This would therefore seem to be a favourable time to revive the manufacture of slates on a larger scale in this country and especially in view of the assured increase in the home demand arising from the rapid growth of our population.

The Dominion Exhibition.

The extensive and interesting display of natural and manufactured products of all kinds shown at the Exhibition which has just closed in Toronto, taken in conjunction with the great improvements made to the buildings and grounds fully warranted the more ambitious title of Dominion Exhibition employed by the management this year. From an architectural standpoint the Exhibition has been rendered much more satisfactory by the erection in permanent materials of a number of well designed buildings, such as the Art Gallery, Manufacturers' Building, Stove Building, etc., and the removal of many small structures which gave to the grounds a crowded appearance. With these out of the way the grounds convey an impression of spaciousness which greatly enhances the appearance of the principal buildings and satisfies the eye. The Stove Building, a substantial brick structure, has already proved inadequate for its purpose. While there was an exceptionally good display of heating apparatus by the various Canadian manufacturers, the exhibit would have been still more representative had the necessary space been available. It seems unfortunate that in planning this building provision was not made for the larger requirements of the future.

In keeping with the permanent character of the new buildings, the exhibits were on a larger and more varied scale than ever before, and received greater attention from visitors. The exemplification of manufacturing processes was a new and instructive feature, and the high quality of the finished products marked "made in Canada," should tend to dispel the too largely prevalent notion that for goods of the highest quality one must purchase from foreign makers. The expense and care bestowed on the arrangement of the exhibits is deserving of praise and gave to this year's Exhibition a refinement in pleasing contrast to the crude results of earlier efforts. In this respect we have no doubt learned profitable lessons from the larger exhibitions in the United States. It is gratifying to know that we have reached a point in our national development where there is demand for beauty as well as utility. This demand is likely to be stimulated by a sight of the many beautiful examples of artistic workmanship comprising the collection of Jubilee presents, the loving tribute to Queen Victoria from her subjects in all parts of the Empire. The Canadian people are under a debt of gratitude to King Edward for the kind consideration which prompted him to allow this valuable treasure to be brought to Canada and placed on public exhibition. The enterprise of the exhibition management in securing such an interesting feature is also deserving of recognition.

Building Conditions

The recently published statement showing the value of building operations in Toronto for the first half of the present year to be considerably in excess of the corresponding months of last year, came as a surprise even to persons most closely identified with the building industry. The opinion prevailed that owing to the long continued strikes the showing would be a bad one. The great scarcity of houses for rent in Toronto has compelled many persons to build, notwithstanding the high cost, and has induced a considerable amount of speculative building of houses of a fairly substantial character. It is in this direction that the greatest volume of building has been done this year. Apart from a number of new factories very few important buildings of a commercial or public character are in process of construction. The high prices of materials and labor coupled with unsettled labor conditions in Toronto led to the abandonment for the present of several costly undertakings. One regrettable feature of the situation is that owing to changed conditions some of these projects may never be carried out. In Montreal as in Toronto the demand for houses is very active, with corresponding activity in building. The suburban real estate sold during the month of July amounted in value to $180,989 and in the city proper to $732,838. The value of building permits for the month named was $533,247. Reports from Winnipeg and other cities indicate that the building operations will probably exceed those of any previous year. Satisfactory as are the existing conditions, reflecting a high state of prosperity, they would have been much more so, had it not been for the uncertainty and delay caused by labor troubles.

It has been estimated that the aggregate cost of large buildings in South Africa now in process of construction or under consideration is about $100,000,000, one half of this amount being for government work. The general tendency is not to be sparing as to the additional expense necessary to insure stability and comfort by the adoption of the most approved modern systems. A suggestion has been made for the establishment by English manufacturers of central depots at Cape Town and Durban, where stocks of heavy building materials would be carried. In the present state of affairs in South Africa there is a marked preference for constructional supplies available for immediate delivery. The results of similar arrangements in other branches of trade seem favorable to the development of this new project.

NOTES OF TRAVEL.—IV.

The Guild of Handicraft.

An actual, practical, going concern, devoted to handicraft as opposed to machine workmanship is worth visiting, and, as the new home of the Guild of Handicraft came by my way, I turned aside for a couple of days to visit it.

The Guild of Handicraft originated in an educational effort in East London. It began with classes for the study of design and the reading of Ruskin, carried on by the Guild's present head, Mr. C. R. Ashbee, at Toynbee Hall, the University settlement in East London. This was in the years 1886 and 1887. Reading led to designing, and designing to its application in practice, all in a small way at first. From this gradually grew a school in connection with a workshop, with the men in the workshop teachers in the school and the pupils in the school becoming gradually drafted into the workshop. When the Guild of three members had a school of fifty members, the indefatigable English benevolent subscribers stepped in—and here the story ends as an example of anything that would be possible in Canada. Funds were provided to carry the school through two trial years, on the top floor of a warehouse which became the school and workshop combined.

The school continued for nine years before it was extinguished by the State-aided competition of the London County Council Technical Schools. In the meantime it had not only had 700 pupils pass through its hands but had strengthened the Guild by the addition of a dozen or so of members, and their work was in demand. Beginning with wood and sheet metal work, they had added other works; they established themselves at Essex House, an old house in the East End, and became an established company of co-operative, autonomous workmen. Organization was in the hands of a committee; the committee elected a manager, who had a free hand in workshop discipline, but the individual guildsman had a right to lay his case before the committee. Such a thing as a real labor dispute is said to have never happened, and the value of the committee as a means of education, in the way of a sense of responsibility, steady and good work—in fact in the cultivation of a corporate conscience—is said to have been immense. The bonus at the end of the year is said to far outweigh, in the added sense of responsibility it gives, its actual cash value: Mr. Ashbee says "we have never found that the actual bonus made much difference; it is always the theoretical bonus that does the work."

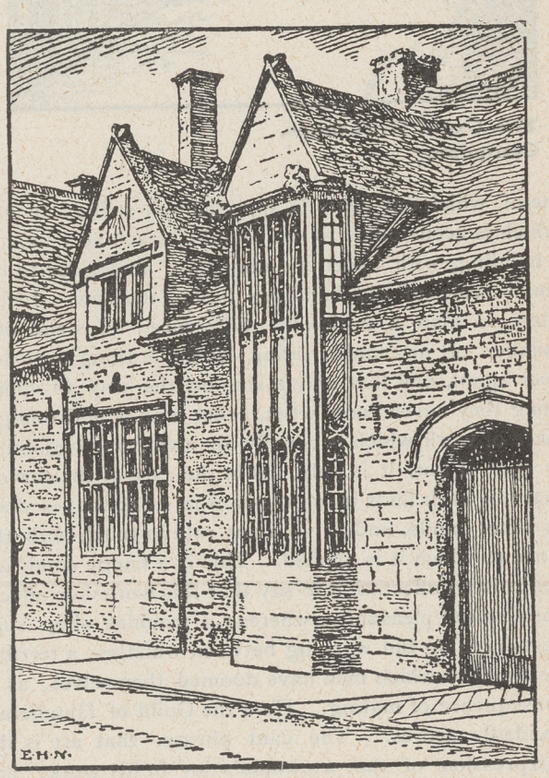
Wages are paid on the basis of the Trade Union rate, wherever there is one, and the principle of inequality in human values is added. If, as sometimes happens, the Trade Union rate, in any individual case, is found to be in excess of the man's market value, the matter is settled by the manager and the Guild Committee in consultation.

It only remains, to complete the history of the Guild, to say that they are now a limited liability company, retaining as far as possible the good points of their original constitution. The workshop committee is still there, and the right of appeal from it to the manager; the committee does not, however, now elect the manager, which is done by the board of directors, but it sends a labor director to the board that does so.

A year and a half ago the Guild, finding itself enlarging to the point when expansion was inevitable, and as London is not an easy place to expand in, made what to an onlooker seems its happiest move, in establishing itself in the country. Having found in Campden, in Gloucestershire, a decayed town, with houses to be got for the workmen, it moved there about a year and a half ago.

High Street, Campden.

Campden, at the centre of the Cotswold wool growing district, was a great wool weaving town in the



A House in Campden.

fifteenth century and later. The old buildings remain —a fine church, some gothic houses, and some of

Renaissance periods ; all of stone. Mr. Ashbee himself possesses a house which contained the old wool merchants' hall, and he thus has a sitting room with a black timbered roof. The Guild workshop is an old stone silk mill in a garden—mill and residence one building, as was the happy way in those days. They have built a machine house with a gas engine and dynamos, for electric lighting and what machinery they use for preparing their wood ; the smithy is also out of doors ; for the rest the three floors of the woolen mill suffice for their several works which comprise, besides the blacksmithing : joinery, wood carving, metal work in silver and brass, jewel making, enamel working, printing and bookbinding. The clink of hammer and

The Guild Workshops, Campden.

metal, which one hears in approaching, strikes an ear, which is accustomed to the sound of machinery in such a building, with a sort of quaintness, analogous to the small scale of old buildings beside the new. Inside there is also a noticeable difference. Instead of a number of mechanics doing the same thing over and over again, and that only a step on the way to something they never know what, every man is here doing a piece of work which is usually his own from beginning to end; if not, it is only, as in the case of the carver, that his work finds its application in work that is done by other hands, and he is at any rate in touch with the work to which it is applied. This is a happy condition and it is no affectation to say that this workshop affects one's spirits pleasantly, whereas a machine shop suggests nothing but working between whistles; a terrible treadmill to which men have doomed themselves, as a consequence of mating. Here the Guild of Handicraft decidedly scores. The cant phrase, that art is the "expression of the workman's joy in his work," has here a chance of exemplification; a man may be interested in his work as well as in his wife. By so much more also that the work is done in a garden, and the air is fresh.

As to the work:—the blacksmithing is of course exactly what blacksmithing should be; a set of Guild fire irons (which, by the way, showed no loving marks of the hammer, but had a sort of lovingness in the soft section of the twist and in a certain whitey blackness of color) would be a pleasure to see—and to use. The smiths are also making electric fixtures which promise to be elegant, though iron. The snakey tendrils of the "pine apple pattern" come in well here. The trail of this serpent is over the work of the Guild. They have also come under the influence of Burne Jones' sinuous female with the high navel. In fact there is a school mark upon their work that seems to be conscious, and intended to suit a market that asks for the kind of thing. In their silver vessels—all of which are beaten out of the sheet metal—the hammer marks remain, because they say people like them so. Their silver work is certainly fine and is more substantial than spun silver. The hammer marks are very slight; not made for effect, but merely left, when the form is perfected, without further work; and the result is a sort of richness of surface; nevertheless, as these marks could be removed by further hammering, the dignity of a silver chalice seems to require that they should be removed. There is no particular virtue in the marks of the workman's hand, except as a trademark of the school that does handwork in an age when machine work is the rule.

Of the same kind is the square edged joinery of this school, which, I confess, bores me. If our rude forefathers did not know enough to mould, we do. There is something tiresome about this inability to adopt the method of good old work without adopting its manner too.

There is the same snare evident in the work of the hand printers. William Morris was not really a reformer in this respect. The Kelmscott Press was only an expression of discontent with the present; expressed by reverting to the past. But that sort of past is past. There is a clear field yet for any one who has been infected with the discontent and would allay it by creating a type with the beauty of usefulness. It is not necessary to create; the earliest printing, earlier than the period Morris preferred, has all the qualities of design combined with perfect legibility. Some of the publications of the Guild of Handicraft are printed in this type, making a perfect book. It is to be hoped that the Guild will be content to shine by this simple excellence. But the market for fine books is the market of the connoisseur and collector, perverted beings who from seeking the peculiarity of goodness have come to seek peculiarity as in itself goodness. The hand printer therefore finds it wise to make sure of his market by designing a special type which will mark the work of his own press; but to design a type that will have special peculiarities, and yet be as simple as the best type—which is the simplest—is a feat which will task even such an accomplished designer as Mr. Ashbee.

The Guild seems to have secured a field to itself in jewelry of modern design. There is a staff of men constantly employed supplying the Guild shop in Bond street, where the jewelry which is displayed makes a very attractive window.

They do also some good enamelling—a seductive looking work as applied to decorative landscape. It is simply glass dust floated on metal and fused in a furnace. Here is the principal difficulty, as the colour, without which the work is nothing, depends upon judgment as to the length of exposure in the furnace.

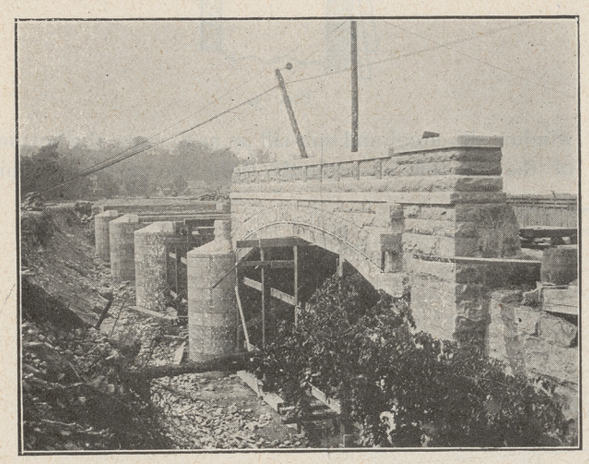
The great satisfaction in working in the Guild workshop, must after all be that designing and execution are, if not always by the same hand, at any rate in such close contact and communication, and standing upon such equal ground, that the designer is really in touch with his material, and this makes designing a pleasure because it makes good design possible.

W. A. Langton.

BRIDGE FOR THE CANADIAN NIAGARA POWER COMPANY.

By Orrin E. Dunlap.

A bridge that is being built by the Queenston Quarry Company for the Canadian Niagara Power Company has several interesting features. The site of the bridge is in Queen Victoria Niagara Falls Free Park, and it is to span the canal inlet leading to the forebay in front of the power station of the Canadian Niagara Power Company. When completed it will be one of the links in a beautiful driveway along the upper Niagara



New Bridge for Canadian Niagara Power Company.

River on the Canadian side, a locality that is just at present undergoing numerous changes as a result of the extensive power development now taking place there. These changes call for many new features, and this bridge is one of them.

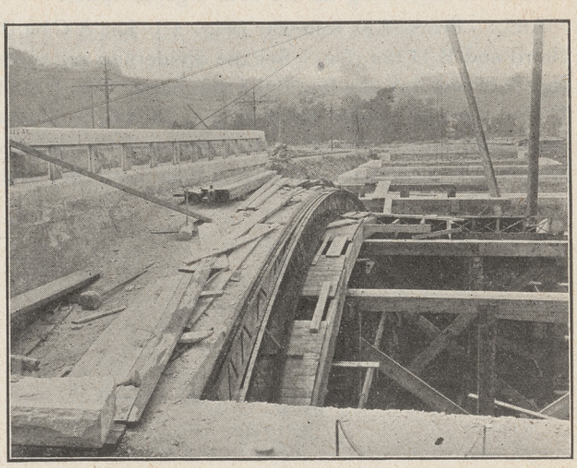
The bridge is to be a concrete-steel structure with stone facing, and in general appearance will resemble somewhat the new bridge erected some months ago between the mainland and Goat Island on the New York side of the river. The length of the bridge to end of posts will be 298 feet. There will be five spans, each of 50 feet, and they will have rises of five feet. The piers will be eight feet wide on the face of the bridge and 66 feet 3¾ inches long to outside of cut-waters. The piers are set on bedrock, necessitating four or five feet of excavation. The stone used in the bridge is from Queenston, Ont. The piers below the springing line are pointed. The belts, washes and the coping are all of fine dressed work. Steel ribs spaced three-foot centers will be imbedded in the concrete of the arches. Portland cement is being used exclusively on the work.

The width of the bridge is to be 55 feet over copings, except at the piers, where there is a projection of about a foot, making the width of the bridge at the widest part about 57 feet. Inside of the copings the width is 52 feet, and of this 26 feet is to be devoted to double tracks of the Niagara Falls Park & River Railway, an electric line that skirts the river on the Canadian side, 20 feet to the driveway, and six feet on one side to a granolithic walk. The roadway is likely to be of porous gravel or cinders finished with macadam. The grade of the roadway will be practically level, the gutters being graded from the center of each arch to the piers, catch-basins being placed over each pier. Drainage is provided to be carried off in cast iron pipes that will discharge at about the springing line of the arch. It may be pointed out that the arches were made of such small rise in order to avoid raising the railway tracks, which will be on a fill approaching the bridge. The abutments of the structure are built of concrete in which large stones are imbedded. A conduit having four compartments has been built in the sidewalk for carrying electric wires for lighting the bridge, a pipe being inserted in each of the main posts. The specifications call for a loading of 5,000 lbs. per lineal foot on one track of the railway, and 100 lbs. per square foot on the driveway.

The arches and backing of the spandrel walls and the piers above springing line, are to be built of Portland cement concrete, the proportions of which are to be one part cement, two parts sand and four parts broken stone. In the piers below the springing line the proportions of the concrete are to be one part cement, three parts sand and six parts broken stone. In the construction of the bridge the contractor is required to trowel two inches of mortar onto the lagging in order to give a smooth surface on the concrete of the soffit of the arch. In building, the contractor is required to start the concrete simultaneously from the ends of the arch and lay it in longitudinal sections. While being built, timber forms hold the sections in place. The tops of the arches and backs of the spandrel walls are to be given two coats of pure Portland cement grout applied with brushes and then covered with two thicknesses of felt. This is in order that the arches may be made waterproof so that the dampness will not come through and stain the masonry.

Before the construction of the bridge a coffer-dam was built between the site and the waters of the river. The water that will pass beneath the bridge will flow to the turbines in the wheel-pit of the Canadian Niagara Power Company. High water will be 1.37 ft. above the springing line of the arch, which will be a depth of 17 9-10 ft. of water in the inlet canal. Low water will be 3.93 ft. below the springing line of the arch, or a depth of 12 6-10 ft. of water in the canal, while the mean stage of water will be 1.83 ft. below the springing line, or a depth of 14 7-10 ft. in the canal.

This beautiful bridge was designed by William A.



New Bridge for Canadian Niagara Power Company.

Brackenridge, one of the consulting engineers of the Canadian Niagara Power Company, and the structure is being built under the direction of Cecil B. Smith, resident engineer of the Canadian Niagara Power Company. It is without doubt to be one of the most beautiful bridges on the Canadian side at Niagara, and will be a material factor in adding to the new beauty of Victoria Park. Its magnificent lines and fine appearance will go well toward showing that even though industry has invaded the Canadian pleasure ground at Niagara, it is the intention of the park commissioners, and also of the Canadian Niagara Power Company, so far as it is concerned, to do nothing that will mar the natural beauty of the surroundings of the falls.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Roofer": I am in want of a handy, quickly-made derrick suitable for using on a flat roof for hoisting up tar, paper and gravel?

ANS.—Perhaps the following simple device will answer the purpose of "Roofer", as it is simple and complete. (See Fig. 1.) The crossed legs are framed together about 3 feet to the fork where the pole rests. The pole I use is 10 feet long, 3 inches in diameter and is fastened on the bottom end by the two 7/8 inch cleats shown. A 3/4 inch tackle and double sheave block may

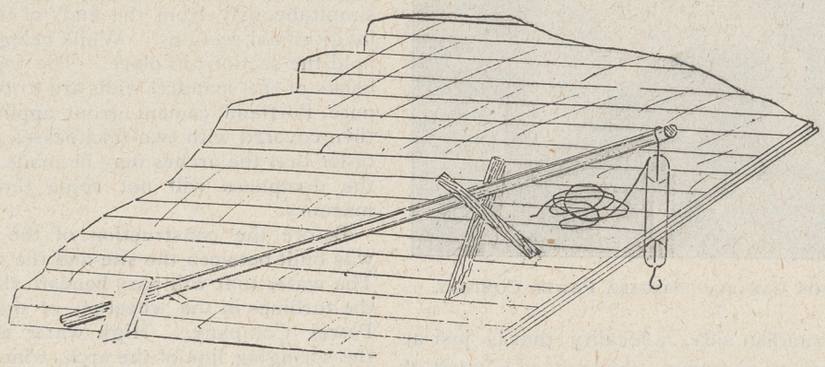


FIG. 1.

be used which will enable the user to haul up a pretty heavy load with ease.

From "Young Workmen":—Kindly describe a quick method of describing an arc over a given space.

ANS.:—Proceed as follows: (Fig. 2.) Let A C be the chord and B D the rise. Set the dividers to any radius less than one-half the length of the chord. With A and D for centers, strike short arcs as shown, producing them until they intersect. Then through the point of intersection draw lines, producing them until they inter-

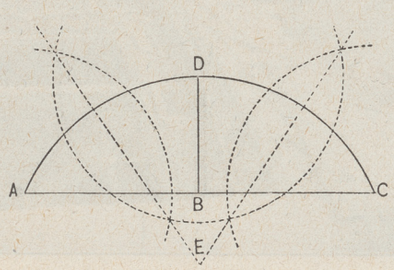


FIG. 2.

sect, as shown at E. Then E will be the centre from which may be struck the arc, and E D will be the radius for the same.

From "Winnipeg":—Will you kindly illustrate a good method of constructing a window sill in a frame house so that it will be water and wind proof; also please show a good method of fixing a cornice so that it will be tight and yet look well, and not too expensive? The building will be a balloon frame built with scantling 2" x 4", having plates formed of 2 pieces, 2" x 4", and rafters 2" x 6".

ANS.:—In answer to this request, we publish a design Fig. 3, showing a good method of constructing a

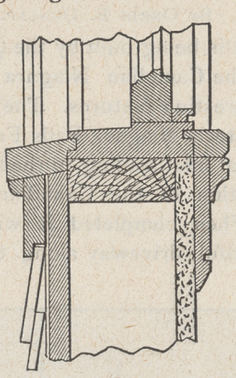


FIG. 3.

window sill, stool and sub-sill so as to make the bottom of the window as perfectly tight as possible. This shows the whole construction, including apron, and the manner of attaching the siding or clapboards on the outside with rain-piece under the sub-sill. This method of finish has proved quite effective. Fig. 4 shows a very good way of finishing a cornice. The siding and bed mould A are cut in snug between the projecting rafters, so also is the rough boarding O O which tends

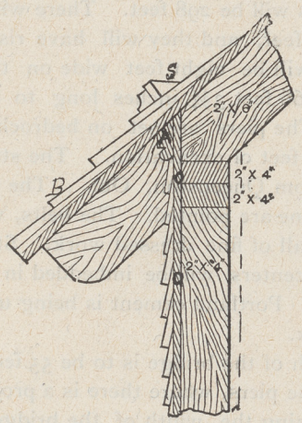


FIG. 4.

to make the whole work tight and wind-proof. This sketch shows the manner of laying on the plates, siding, rough boarding and inside plastering. Shingling and gutter are shown at B and S respectively.

From "Builder":—I live in a part of the country where stone is plentiful and where a number of stone buildings have been erected but have not proved satisfactory owing to the fact that much settlement of the buildings has occurred, and cracks in the walls have resulted, and water manages to get into the walls

over and under the windows and doors, during heavy rain-storms. I have one or two stone buildings to erect, and would like if you would suggest some practical solution of this trouble that will enable me, and others, to "build in stone" satisfactorily ?

ANS. :—The underlying cause of all this trouble seems to us to be haste in finishing the building ; hence the first thing to be done, and without which all else is practically useless, is to "make haste slowly." Time should be given the mortar to harden, the building to settle, and the cracks to show before the pointing is done. No stone house should be pointed the same year it is built, for two reasons : First, the cement used in pointing forms a barrier to the evaporation of the moisture in the mortar in which the stone is laid, and prevents it from drying. The pointing, while keeping the moisture from coming out, will not prevent the frost from going in and freezing the mortar ; this will produce an expansion which causes the pointing to lose its grip on the mortar, and creates innumerable crevices through which the water easily finds its way. Secondly, all stone buildings, even when built in the most careful manner, have a tendency to settle. This settlement cracks the pointing. In many cases these cracks are so fine as to be scarcely visible, especially if some distance from the ground. But no cracks are too small for water to penetrate, driven with the force given it by the wind from an open sweep of miles, as it has in the country. It is absolutely essential, therefore that the mortar should have time to evaporate all its moisture and become thoroughly dry, and the building time to settle, before pointing. Houses built with stone and having all the windows arched solidly through the entire thickness of the wall with brick, seldom have water dropping from the soffit of the frame ; for if any water should beat through the stone work or cracks in same, the bricks having the power to absorb so much of the water, holds it while the rain lasts, and after it is over evaporates it to the outer air. When impracticable to use brick over the windows, from architectural or other reasons, a piece of sheet lead going through the entire thickness of the wall and extending about one foot each side of window, and turned up two inches on the side, will hold the water until it evaporates. A style of architecture much in use at this time necessitates exposed gables. These gables are usually finished so late in the season that the mortar has not time to dry before frost sets in, and in consequence the mortar freezes. Mortar once frozen loses its adhesiveness, and therefore has no life in it. The proper and only safe plan is to use Portland cement and sand (no lime) in all gables. This will set in one-tenth the time of lime mortar, and will be hard and dry before frost comes. All store gables that rise above the roof and are only protected by stone coping should have a sheet of lead to cover the entire wall put on under the coping. This lead should project over the inside of the wall and be turned down over the flushing of the roof. By this means all water that gets through the joints of the coping will be carried off. In conclusion, with care and a proper observance of the natural laws governing the materials used in its construction a stone building can be built in the present day just as tight as years ago, when people did not expect to excavate the cellar in the spring and move into the finished house in the fall.

From "Painter":—Will you kindly give me a few hints regarding the method of estimating for painting and oblige ?

ANS. :—For this work we would suggest that you obtain a copy of "The Canadian Contractor's Hand-Book and Estimator" which will give you full particulars regarding estimating on painting. We publish the following however, which may assist you at the present ; painting is generally estimated by the superficial yard, and is very easily estimated when the number of square yards of surface to be covered is known. We will offer a few rules to assist in the work of determining the square yards of surface to be painted in ordinary buildings :—Take the measurements, the distance around the house, and the height from bottom of sill to top of plate, in feet, and multiply the two together for the square feet in the main body of the house. To this add the feet in the gables, and also the feet in the cornice. The feet in the cornice can be found by multiplying the entire length of cornice by width, and which can be taken at 1½ to 2 feet wide. After the square feet of surface have been found, divide by 9 to reduce to square yards. More or less difficulty may be found in figuring the square yards in estimating porch and veranda work. This may seem rather difficult to get at by many, but we will try to make it an easy matter to arrive at approximately the correct surface measurement. Multiply length in feet by width, and multiply this product by 2½ to make up for the ceiling, cornice, columns, and if the roof is to be painted, multiply by 3½ instead of 2½ ; the amount will be in feet and must be reduced to yards. Inside finish :—Doors with their casings may be counted at 6 yards per door ; this includes both sides. Windows may be counted at 3 yards per window. The base in the average rooms, can be estimated at 4 yards per room, for medium size rooms, and 5 yards for the larger rooms. The wainscoting of an ordinary kitchen can be placed at about 12 to 15 yards. The average bath room can be estimated at about 12 yards. A staircase may be estimated at about 12 to 15 yards. The cost of finish may be estimated at 14 cents per yard for two-coat work and 18 cents for three coats. These figures of cost, however, are only an average, as for plain work, the cost may be as low as 11 cents for two coats and 15 cents for three coats, while for graining or other costly work, it may be run up to 30 cents per yard.

A plant for the manufacture of cement building blocks is being established at Westbourne, Man.

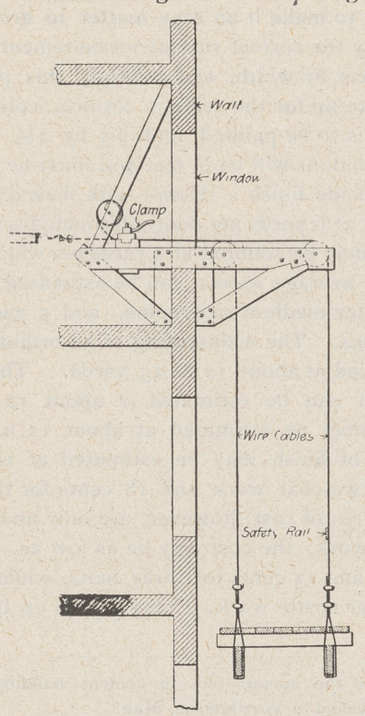
In order to aid master steam fitters in preparing more exact estimates, the large manufacturers of heating boilers in the United States have decided to allow full freight hereafter on shipments to central and eastern territory.

A method of splicing wire ropes for use on an 18 or 24-inch hoisting drum is to take a 6-in. piece of black iron pipe, which must be ¼-in. larger in diameter than the wire rope, unravel the ends of the wire rope and insert into the pipe, so that the ends touch in the middle of the pipe. Stop up one end of the pipe around the rope either with putty, or if this is not at hand with common mud. Hold the rope and pipe in a vertical position and pour enough babbit metal in the pipe and around the ends of the rope to fill up the pipe completely and the result is a splice that is ready for immediate use and is as strong as the strongest part of the rope.

A SAFETY SWINGING SCAFFOLD.

The day of the old-fashioned wooden scaffold for building construction is rapidly passing, at least on large work. Instead of the once familiar staging of slender wooden posts, X-braced with boards, with its put-logs and loose board plattorms, several forms of working stages have come into use which can be more rapidly erected and removed, are safer and more economical, and have other advantages. A safety swinging scaffold designed particularly for use in the facing of high buildings of steel-frame or ferro-concrete construction which have an outside covering of brick, terra-cotta or stone has recently been patented, says the Engineering Record, by W. H. Ellis & Company, of Cincinnati, and successfully used by them on the 15-storey concrete-steel Ingalls Building in Cincinnati, now nearly completed.

The Ellis scaffold consists substantially of a platform in sections, suspended by wire cables from brackets supported by the walls of the building at window openings in an upper storey, as indicated in the drawing. Each pair of cables supporting the platform sections passes over two sheaves in the horizontal member of a bracket and are held by a clamp inside the building. The platform may be raised or lowered by means of a block and tackle attached to the cables and may be held at any height convenient for the work. The platforms have solid floors, preventing the dropping of materials and an outside guard rail ensuring the safety



A Safety Swinging Scaffold.

of the men. Preferably the sections are placed to abut, so as to form a continuous staging along a whole side or clear around the building, so that the work may be completely finished to any given level before raising the scaffold. Other advantages of this scaffold besides those indicated are that the sidewalk and the portions of the building below it are not obstructed and the work below may be left completely finished instead of having put-log holes to be filled afterwards.

A company has been formed at Warden, Que., by Austin Berry, to manufacture a hot air heating furnace of which he is the inventor.

A BUILDING TRADES ORGANIZER.

Mr. Charles L. Eidlitz, whose portrait is presented herewith, is the recognized leader of the movement which resulted in the successful organization this year of employers in the various departments of the building trades in New York city. By means of this organization known as the Building Trades Employers' Association, the unjust demands and methods of the

Mr. Charles L. Eidlitz.

unions have been successfully resisted. Mr. Eidlitz, who has been elected President of the Association, is a native of New York, 36 years of age, and a graduate of Columbia University. For fourteen years he has been engaged in electrical contracting.

CONDITIONS IN SOUTH AFRICA.

So difficult has it become to secure needed help in South Africa that an emigrant's information branch has been opened in London under the auspices of the Agent General for the Cape of Good Hope and Sir Gordon Sprigg. There is urgent demand for building mechanics. Wages for carpenters are 11 to 12 shillings per day, with a rate of time and a quarter for first two hours of overtime, after that (and on Sundays) time and a half, 48 hours constitute the week. A third-class free passage out is given, with half-pay on voyage ; the agreement being for one year, and the government having the right to extend it for another two years. If men are incompetent or are dismissed for misconduct they are required to refund the passage money and the half-pay on voyage. There is a large demand for substantial building materials, and for brick and quarry machinery. Owing to apathy of British manufacturers the bulk of the orders are said to be going into the hands of United States firms. To secure this business it is said to be necessary to have representatives on the ground.

According to a correspondent of the Iron Age there would seem to be a good market in Mexico for roofing material. He states that with the exception of the modern buildings in two or three of the largest cities, leaky roofs are the rule. There are comparatively few houses in the city of Mexico whose roofs would withstand a 12-hour downpour in the rainy season and afford no evidence of water dripping down the walls inside the living rooms. Roofs are generally constructed over adobe buildings in a very defective way. Common "shakes" are laid across huge roof beams, or "vigas," making a flat covering, upon which is laid earth from 1 to 3 feet deep. This earth is capped with small earthen tiles. No patent roofing material of any kind is used to make the roof water tight. Between the seams of the tiles the heavy rains soon find a way, softening the earth and rotting the "shakes." After heavy rains, not infrequently half a wheelbarrow load of the earth covering falls within the rooms beneath.

THE SCIENTIFIC BASIS AND COMMERCIAL FEASIBILITY OF HEAT RADIATORS, USING AIR INSTEAD OF WATER OR STEAM.*

By George M. Aylsworth M.D., Collingwood, Canada.

In the past many have thought that air could be used in radiators instead of water for the distribution of heat, and about twenty years ago a U.S. patent was issued covering the point.

The scheme, however, proved a complete failure owing to the radiator being simply a square box many times the capacity of the conducting pipes. The current of air was so rapid that it passed through this box radiator in a straight line and an enormously large proportion of the air in the box was not changed in temperature at all. As a consequence the hot air parted with but a small percentage of its heat, while passing through this box form of radiator. The general appearance and construction of the radiator is shown in Figure 1. The scientific reasons for the adoption of its peculiar form and the use of thin sheet metal in its construction are as follows :

The conditions requiring to be met were a distributing agent that would make the circuit of the furnace and radiators many times while water was making a similar circuit once. At the same time, the rapidly moving air would absorb much less heat from the furnace, bulk for bulk, than the slower moving water.

The problem therefore was to evolve a radiator that would compel the air passing through it to part with all or nearly all of its heat to the air of a room without diminishing the rapidity of the travel of the confined air.

The problem has been solved by the adoption of four devices.

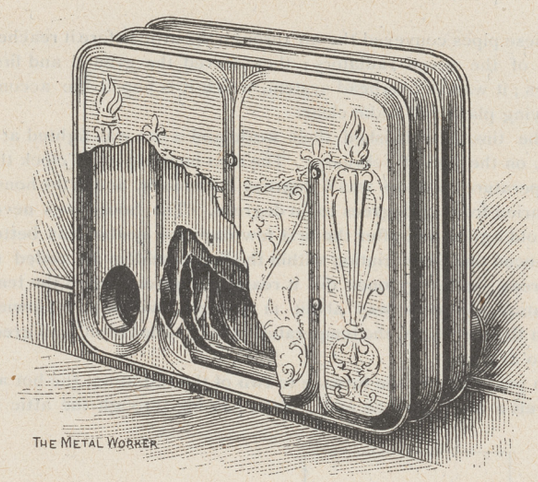


Fig. 1.

First, by increasing the distance the air has to travel within a short space.

This was accomplished by the up and down or to and fro course the air is compelled to take in passing through the radiator. The distance from the centre of the inflow pipe to the centre of the outflow pipe is 2 feet, while the air travels in the radiator four and a half times as far, or an average of 9 feet.

Second, by offering the least possible obstruction to the passage of the heat from the air within the radiator to the air outside the radiator, but within the room.

This was accomplished by using sheet metal as thin as is consistent with rigidity.

Third, by compelling the volume of air to spread out into thin sheets so that all of it while passing through a radiator, should be kept as nearly as possible in contact with the enclosing metal.

This is accomplished by having the conduit through each section of the radiator, 1 x 7 inches rectangular in form, instead of round or square. The method of piping consists in having the area of the conducting pipe equal to the areas of the conduit or conduits in the radiator or radiators served by it. Also in having he volume of air necessary to serve a radiator, whether it have one or more sections, conveyed to the radiator in a single round or square column.

It will be noted that this method causes the difference between the circumference of the supply pipe and the conduits in the radiator to increase with each section that is added to it. The conduit in a single section has nearly double the circumference of its round supply pipe, while the conduits in a four-section radiator have three and one-half times the circumference of its round supply pipe.

The conducting pipes of a single section are round 3-inch pipes having a circumference of 9 inches and an area of 7 square inches, while the conduit through the section has a circumference

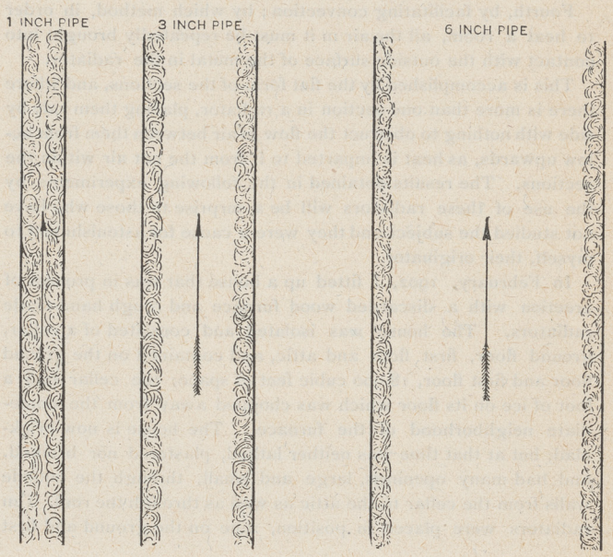


Fig. 2.

of 16 inches and an area of 7 square inches, or the same area as its supply pipe.

A four-section radiator is served by a 6-inch round conducting pipe, having a circumference of 18 inches and an area of 28 square inches, while the sum of the circumferences of the four conduits is 64 inches and the sum of their areas is 28 square inches, or the same as their 6-inch conducting pipes.

The extremely flat shape of the conduit through a radiator also prevents any part of the air it contains getting more than half an inch from the enclosing metal, while the centre of the air current through a 3-inch round pipe is 1½ inches away from the containing metal or three times the distance, and in a 6-inch round pipe, 3 inches or six times as far from the metal, and so with each change in the number of the sections in a radiator.

It is a well-known fact, which can be confirmed by observation

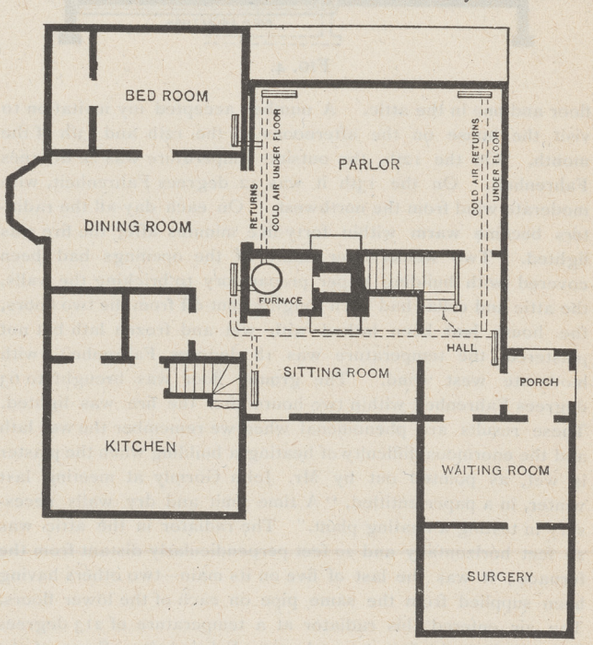


Fig. 3.

of any stream of water, that fluid in contact with the wall of a pipe, on account of the friction, takes on a revolving motion while passing through it, but the whole area of the current does not partake of this revolving motion unless the pipe is extremely small. The part of the area of the current that is unaffected by this motion increases in proportion to the whole area of the pipe, provided the rapidity of the current remains the same. (See cut).

*(Presented by request at the Summer Meeting of the American Society of Heating and Ventilating Engineers, Niagara Falls, N.Y., 1903.)

This fact in connection with the other facts—that air cannot possibly get more than one-half inch from the confining metal when passing through one of these radiators, and can get from three to six times that distance from the metal in the pipes conducting the air to them—suggests the vast importance of the flattened conduit through the radiator.

Fourth, by facilitating convection; by which method, in order to heat a room, all the air in it must be repeatedly brought into contact with the outside surface of the metal in the radiator.

This is accomplished by the flat form of the sections, and where there is more than one section in a radiator, placing them side by side with nothing to obstruct the flow of air between them from below upwards, as heat is imparted to it from the hot air within the sections. The results obtained in the following experiments by the use of these radiators will be a surprise to those who have not studied the subject and they were a cause for astonishment to myself, their originator.

In February, 1902, I fitted up a house that was in process of erection with a discarded wood furnace and rough hand-made radiators. The house was isolated and consisted of a cellar, ground floor, first floor and attic, and contained on the ground floor and first floor, 18,000 cubic feet of space; the cellar had a foot of ice on its floor which was chopped away from the immediate neighborhood of the furnace. The house is now brick-clad, but at that time was neither lathed, plastered nor bricked, and had many openings, large and small, through the outside walls from the cellar to the attic as well as through the roof. Ten radiators were placed in position, nine on the ground and first

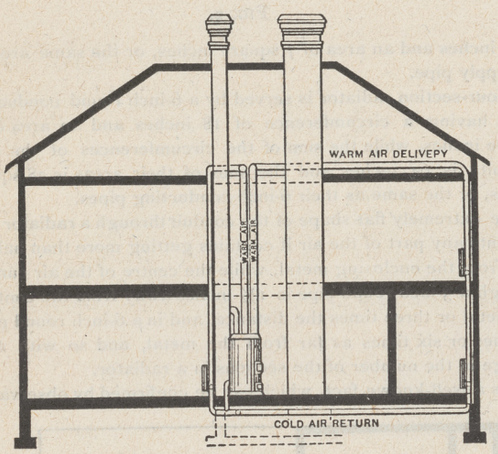


FIG. 4.

floor and one in the attic. A number accepted my invitation to visit the house on the afternoons of the 12th and 13th of the month. On the 12th, the outside temperature was 22 degrees Fahrenheit. On the 13th it was 12 degrees Fahrenheit, with moderate wind from the northwest. On each day all the radiators became warm within forty-five minutes after the fire was lighted. Two weeks later many of the openings had been covered with building paper preparatory to bricking the walls, the attic and cellar had been roughly shut off from the two floors, the house had been lathed with wet and frozen lath but not plastered, the temperature was 18 degrees Fahrenheit, with moderate west wind. The ground floor was brought to 63 degrees Fahrenheit within two hours after the fire was lighted. These results are phenomenal when we remember the wet lath and the enormous difficulty of heating a building when the plaster is wet, as pointed out by Mr. John Gormly at meeting last winter, in a paper entitled, "A time limit and dry walls necessary in testing a heating plant." The radiator in the attic was 20 feet horizontally and 20 feet perpendicularly distant from the furnace; it was the last of five on its main—two others having been supplied from the same pipe on each of the lower floors. The air entered this radiator at a temperature of 213 degrees Fahrenheit, and left it at 122 degrees Fahrenheit. Some of the heating experts present at this test believed, or at least said, while admitting the results, that the system would not stand a practical test of the many turns in the piping needed to place radiators at the points needed or preferred by house owners, nor would it succeed with the slower fire, as from anthracite coal.

To meet these objections, and having in the mean time had the radiators made in a presentable form, I fitted up my own house with them in 1903.

The house was an old-fashioned frame of two stories, the part served with radiators containing 17,000 cubic feet divided into ten rooms and two halls. There being no basement nor cellar, the furnace was set upon the ground floor and burned anthracite coal. It had never been repaired nor had its location been changed, although it had been in use for thirteen seasons. The ten radiators installed were supplied from three main pipes, two

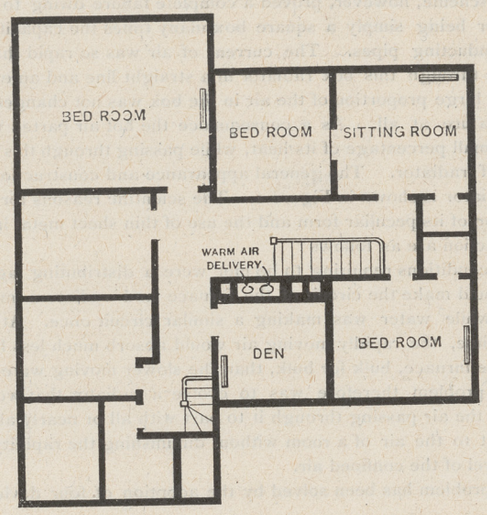


FIG. 5.

of these pipes conveyed the air through the attic before it reached any of the seven radiators; they served the ground and first floors; it was an overhead system, which it is hoped the accompanying plans will make clear.

The tinsmiths finished their work and a fire was lighted at 2 p.m. on the 19th of February. The next morning at 8 o'clock the temperature outdoors was 6 degrees Fahrenheit, and in the house it varied from 44 degrees to 60 degrees. The house was never as cold again, and after the first few days the system was better balanced and the variation within the house seldom exceeded 10 degrees, and only once did it reach 16 degrees, when the temperature outdoors was about 11 degrees, with a gale blowing from the northwest, the temperature within varied from 54 degrees to 70 degrees.

In passing from the furnace to two of the radiators, the hot air travels a distance of 62 and 71 feet, passing through the attic to

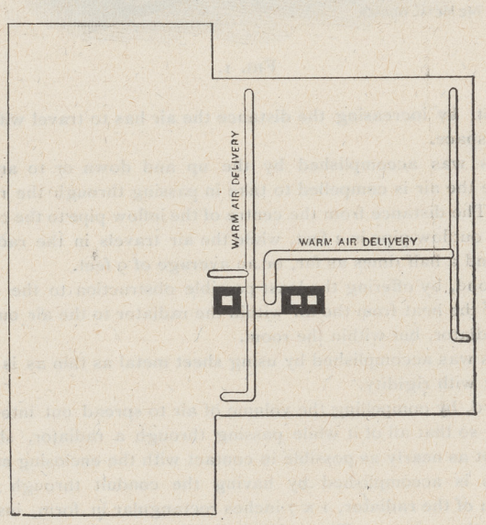


FIG. 6.

do so. In making the circuit from the furnace to these two radiators and back to the furnace, the air travels 107 feet and makes 13 turns, exclusive of the radiators, which if counted would make the air travel 116 feet with 21 turns, showing conclusively that turns in the piping have little or no effect upon the flow of air when it is confined and used in this way, and demonstrating how easily any probable conditions in any medium-sized building can be met with this system.

The foregoing results are much better than could be obtained with this furnace under the old system, for before the installation

of the radiators it had been found necessary, in order to get the same comfort, to supplement the furnace with two stoves and a large drum on the first floor. The latter utilized the heat from the smoke pipe of the furnace and it and the two stoves were done away with after the radiators were put in. Over and above this a very large percentage of the heat generated by the furnace is wasted, while the hot air is passing through the pipes in the attic before reaching the radiators. For the large amount of piping in the attic kept it at a higher temperature, notwithstanding attempts at insulation, than either of the lower floors, which of course was not the case before the radiators were used.

As to the consumption of fuel, it is impossible to be exact in connection with these experiments, but the quantity consumed during the two and one-half months the radiators were used would indicate that the present arrangement will not require more than the old one has done.

One of the reasons for uncertainty in estimating the consumption of fuel, in addition to the removal of the two stoves and heating drum aforementioned, is its rapid diminution, as the best method of running the furnace under the changed conditions was learned—for instance, two tons of coal were consumed in the first 18 days, a third ton in 11 days, or (omitting fractions) a ton every 11 days. A fourth ton was burned in 23 days, and a fifth in 18 days, or a ton every 20 days. That is an average per day of twice as much burned during the first 29 days than was burned

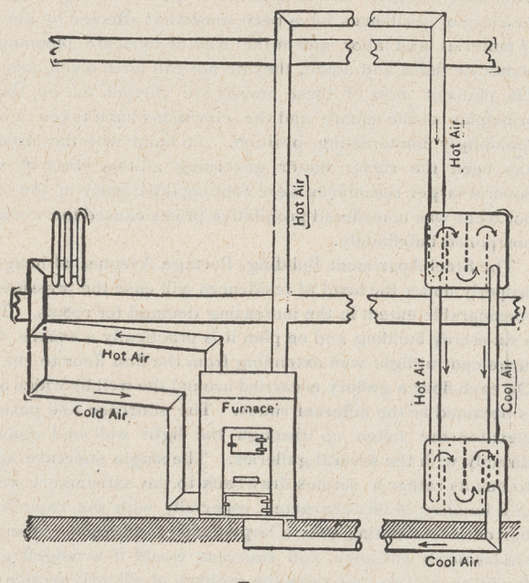


FIG. 7.

during the last 41 days, though the average was within a degree of being the same in each of the two periods with increased comfort during the latter. The rate at which the coal was consumed during the 41 days is almost identical with the rate of consumption in the past when registers were used.

The diameter of the fire pot in this instance is 18 inches, because the builders of the furnace claimed that that size pot was plenty large enough to heat 18,000 cubic feet. But this, as was not unusual in those days, was an overestimate, and at the present time it is unusual to find a reliable hot air furnace-maker making such a claim even when the familiar instructions—"Locate the furnace so that all hot air pipes shall be as short as possible" and "Place registers as close as possible to the furnace" are closely followed.

In this test of hot air radiators these rules have been purposely violated, and the departure from them is so wide that it is believed that 50 per cent. of the heat from the furnace is lost in transmission to and through the attic.

It is not anticipated that any one in his senses will adopt such an overhead system except under compulsion, neither can it be expected that the results under the conditions of this test should be ideal, yet they are the basis of the confidence felt that the proper installation of these hot air radiators will demonstrate beyond all question, during the coming winter, a decided economy in the consumption of fuel through their use.

DISCUSSION.

Secretary Mackay: Before starting a discussion I move a vote of thanks to Dr. Aylsworth for his courtesy in preparing this paper and presenting it to our Society. The motion was carried.

Prof. Kent: I notice that the rate of coal consumption is said to be the same as when registers were used, and would like to ask what is the advantage of this system?

Dr. Aylesworth: A large proportion of the heat was wasted—I estimate 50 per cent.—by passing through the attic, so that there was really more heat produced from the fuel.

Another advantage is that the air does not pass over the excessively hot surfaces of the furnace and then into the rooms, which is one of the points raised by steam and hot water advocates as an objection to the use of furnaces.

Mr. Switzer: Had you any supply of outside air?

Dr. Aylesworth: None whatever. My house has a large ventilating shaft, but there is no ventilation in connection with this air that passed through the radiators. The shaft passes between the two chimneys, up through the roof, forming a continual exhaust from the rooms; there are also two fireplaces on the ground floor.

Prof. Kent: How serious is the objection to having the air pass over the furnace in the usual way and be discharged into rooms?

Mr. Cobey: There is more or less objection to burning out certain elements of the air before we breathe it.

President Crane: The temperature given for the air passing into the radiator is 213 degrees, and that at the exit 123 degrees—a little hotter at the entrance and cooler at the exit than in a well balanced hot water apparatus, which is not commonly more than about 180 at the flow, with a diminution of about 15 degrees at the return.

Prof. Kent: This strikes me as a very well designed system for the results sought to be accomplished. Reducing the temperature from 213 to 123 shows an excellent design of the radiator, and the piping system must also be very well designed in order to avoid short-circuiting the air. In larger houses, with more branch pipes, I should expect more difficulty in circulating the air uniformly.

I do not see that pure air is hurt by passing over surfaces at 300 or 400 degrees. If it contains bacteria you may cook them and have a bad smell, but I think that is unimportant in practice.

A disadvantage of this system is that it does not ventilate as do other furnace systems, which is a strong argument in their favor.

This system would circulate just the same if the radiators were left out. The air would be discharged into the room, be breathed and returned to the funace to be reheated. A disadvantage would be the possible leaks in the furnace.

Mr. Feldman: Dust contained in the air passed over a furnace is sometimes burned in cold weather, and can be smelled.

Mr. Roys: In an ordinary furnace-heated house the wind forces the heat to the other side of the house. In this case the circulation is not affected by the wind, which is a very great advantage.

Mr. Allen: In Fig. 4 the two circuits of pipe are shown as very unequal in length. I would ask if they are of the same size?

Dr. Aylesworth: No; the size of a pipe is governed by the amount of radiating surface it supplies.

Mr. Oldacre: How is the radiating surface proportioned to the contents and exposure of the rooms?

Dr. Aylesworth: The same as with steam or water.

Mr. Switzer: What is your source of air supply? If some of it escapes and the supply is insufficient to carry away the heat from the furnace, fuel would be wasted.

Moreover, it would shorten the life of the furnace to reduce the quantity of heat taken away from its surfaces.

Dr. Aylesworth: The system is not absolutely air tight any more than an ordinary furnace is. In practice, the furnace was used for two or three months and there was no perceptible loss of power, either by diminution of the volume of air or deterioration of its quality.

Mr. Oldacre: If in a furnace heated house one side is colder than the other the work is not properly done.

Secretary Mackay: I do not agree with Mr. Oldacre. I think that in 90 out of 100 cases the furnaces on the cold side of a building act as a cold air supply. I take it that the doctor heats his house more satisfactorily with the present system than he was able to before with the same furnace.

Mr. Chew: An ordinary furnace is to some extent preserved by the constant flow of cold air over its surfaces. In this case the

surfaces are exposed to what is comparatively a hot blast. The question is, how long will the furnace stand such treatment?

Mr. Cobey: I do not think a fire pot is more likely to be destroyed by passing 120 degree air over it than by air at zero, which is likely to disturb the iron by unequal contraction.

Mr. Chew: Moreover, to raise air from zero to 200 degrees the fire pot would have to be white hot, which would not be necessary if the return air is at 100.

Mr. Oldacre: I have never observed any deteriorating effect from cold air—even 10 below zero. The highest temperature of air discharged from a register, in very cold weather, was 190, which I consider too high, and that more air, at a lower temperature should be used—not above 150. The larger the volume of air the more nearly it approaches the quality of outside air.

Mr. Roys: I think Mr. Oldacre is speaking of an ideal system, while the Doctor is speaking of common practice. In my experience I find the air coming from registers as high as 400 degrees, and only getting down to 150 in mild weather.

Mr. Oldacre: Would not the casing of this furnace be so hot as to lose much heat in the cellar? When air is taken from outside the casing is so cool that you can put your hand on it. When I have found a hot casing it has indicated poor circulation, or some other trouble.

Mr. Roys: As a furnace is commonly installed it would often be impossible to even touch your hand to the top of the casing. I believe the fire underwriters say there are more fires caused by hot flues than any other cause.

Mr. Oldacre: I would like to have pointed out to me a single case where a house was set on fire by a hot pipe—I do not mean the chimney.

Mr. Roys: Mr. Sims, of the board of underwriters, claims that there are hundreds of such cases.

Mr. Switzer: I know of such a case. The wall pipe was not protected in any way and the pipe was air bound, so that it did not circulate. It was in 10 below zero weather, with a 30 mile gale forcing the air into the lower rooms, which grew colder, and this pipe to the second storey got hot enough to ignite the wood work.

One of the objects of this society is to educate men to put in furnaces as perfectly as those Mr. Oldacre describes, which it is entirely possible to do.

Secretary Mackay: Dr. Aylesworth does not mention any valves or dampers to shut off the heat from a radiator. What effect would it have on the furnace to shut off one room or more?

Mr. Cobey; The system is in a primitive state, and the controlling appliances can easily be added. I think we shall some time adopt the direct radiation with separate provision for ventilation. I do not think it desirable to introduce the heat and the air for breathing through the same duct as it often gives a bad odor.

Mr. Schaffer: Answering a question of Mr. Chew, I will say that a furnace supplied with air from inside will last longer than if supplied with air from outside.

Prof. Kent: I would ask the size of these radiators.

Dr. Aylesworth: My present idea is to limit the radiators to four sections, of about 14 square feet of surface to the section.

In regard to heating the cold side of the house with these radiators, the colder the exposure the more rapid the circulation in the exposed radiator.

In regard to dampers, the instructions to the manufacturer who shipped this radiator here, were that he should put the damper in place, in the inflow pipe of the radiator, at the bottom. The effect of closing a damper would be the same as closing the register on any furnace, or any steam or water radiator.

For special ventilation it is planned to place another pipe outside of the exhaust pipe of the radiator, and connect it with the outdoor air.

Prof. Kent: I would ask how the Doctor gets a loss of half the heat in the attic?

Dr. Aylesworth: The attic covers the whole building, has roof exposure, and was kept warmer than the rooms below; there was a good deal of piping in it—the pipe, which is 10 in. at the start, runs 34 feet.

Prof. Kent: How would you change that in another building?

Dr. Aylesworth: Put the horizontal pipe below the floor.

Mr. Chew: I notice in Fig. 7 two systems of piping are shown; that at the right going up through the attic and that at the left being a direct flow pipe along the cellar ceiling, with a pipe up to the radiator and coming directly back. I would ask the Doctor's preference.

Dr. Aylesworth: It is decidedly preferable to carry the pipes through the cellar.

Mr. Oldacre: What are the advantages of this system over hot water or steam?

Dr. Aylesworth: It is cheaper to install and the expense of repairs is slight.

NORTHWEST LETTER.

(Special Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

WINNIPEG, Sept. 9, 1903.

Although the building season here is not by any means closing in, yet all important work that is to be roofed before the hard frost comes is now well under way. The season has been a most satisfactory one from a builder's point of view and the amount of work that has been carried out is almost incredible compared with that done in former years. The great advance in prices both of material and labor this year would, it was expected, cause buildings to be cancelled to such an extent as to possibly retard the progress of the city, but contrary to expectation the quantity of work proceeded with has been so great that only by the united efforts of the contractors has it been successfully coped with.

Apart from the business blocks, warehouses, etc., the number of residences in course of construction is enormous, and although most of these are not of a very high order of architecture yet the relief they will give in this direction is most edifying. The better class of residences have been somewhat affected by the price of material and labor and in the way of intricate planning and elaborate finish and detail, they do not call forth much comment. The plans of most of these houses are carried out on the first principles of the square and the elevations have taken a correspondingly uninteresting position. To build with the least cost has been the ruling factor governing all this class of work. Several larger residences were contemplated early in the season but what was considered prohibitive prices caused the work to be postponed indefinitely.

The Steel Apartment Building, Portage Avenue, although not properly under the head of residences will ease the pressure to a considerable extent in the increasing demand for rooms. This is a six-storey building and on plan it is practically a square with a large central light well extending from the first floor to the roof. On each floor a gallery is carried around the well by which access is obtained to the different suites. The staircase and passenger elevator are taken up through the light well and connected directly with the several galleries. The single staircase appeals to one as rather a serious drawback to the satisfactory working of a building of this character, especially with the capacity this has of accomodating such a large number of people. A separate tradesmen's entrance and staircase would if arranged greatly facilitate matters and solve the problem of efficient service to the different floors. Each floor is divided into eight suites, each containing from three to five rooms with a bath room to every suite. A rather doubtful arrangement has, I think, been planned for the bath rooms and kitchens. These rooms are all lighted from the central light well, this light well itself being covered in with a skylight and rendered practically a closed area. In elevation the building is extremely simple; the material is buff pressed brick (Lac Du Bonnet) and Tyndall stone bands.

Apropos of residences, I am sending you for this issue of the CANADIAN ARCHITECT AND BUILDER a photograph of a summer house for Mr. R. Wilson. This house is beautifully situated on the bank of the Assiniboine river at St. James, about four miles west of the city. In plan it is rather interesting, and I enclose a rough line drawing of same. The front of the living room opens by means of glass doors, the full width and height of room, so that in warm weather this room becomes practically a large verandah. The kitchen arrangement is most satisfactory as it is really quite detached from the remainder of the house and all heat and odor emanating therefrom is kept absolutely clear of the living rooms.

In taking up the larger work the banks call for the most attention. The completion of the Bank of British North America has been somewhat hampered on account of the delay experienced in waiting for stone and progress for this reason has been much slower than was anticipated. The work will, however, be ready for the roof towards the end of the month.

The contract for the Union Bank's eleven story steel frame building has been awarded to the Fuller Construction Company, of New York. It is needless to give a dissertation on the status

of a company which has reached such unprecedented records both in the amount of building continually under its supervision and in the remarkably short space of time in numerous instances required for the erection of same. The company is commonly known as the pioneers of steel frame buildings and their name is synonymous with "sky-scraper." The receiving of this contract has caused a new departure in the business of the Fuller Construction Company as it opens up a field in Canadian work which up to now had not been entered upon. Although the granting of the contract for such a large work would perhaps have been more satisfactory if it could have been given to a Canadian firm, yet in the present instance it can hardly be looked upon with disfavor. The methods employed by such a company, who are habitually used to command material and labor in any proportions, will be most interesting to follow in this western country where the supply of material of all description is chronically infinitesimal. To push a work of this category in Winnipeg with anything like the marvelous rapidity with which it is consummated in the States would from our present mode of building be nothing short of a miracle, and the entry of such builders amongst us cannot help but accelerate the movement of material in all quarters, and the benefit accruing from such cannot fail to eventually benefit the community at large.

The undertaking of a building of this description by the Union Bank cannot but be an incentive for other institutions of like calibre to follow aad we may in the near future anticipate a series of like structures to be erected.

The building of the Carnegie Public Library is at last under way. The commission for this work was finally awarded to Mr. S. Hooper, architect. The original competition, open to all architects in Winnipeg, was after much turmoil and many stormy and unprofitable meetings, cancelled by the City Council on the grounds that the tenders on the first three selected designs were above the stipulated cost, and the remainder of the designs (five) not meritorious enough (presumably) in their opinion to warrant them considering same for tender. A second competition was subsequently held when Mr. S. Hooper and Mr. F. S. Griffiths were invited (the remaining original competitors ignored) to again submit plans in competition. Mr. S. Hooper was the successful competitor in the duel. Messrs. Smith & Sharpe are the contractors for the work and they expect to have the building closed in before the severe frost arrives.

Augustine Presbyterian church, Fort Rouge, Mr. J. H. Russell, architect, is well under way. The cost of the work is roughly about $40,000. The building will be faced with Tyndal stone throughout.

The Land Titles large new building on Broadway is progressing, but sufficient work has not yet loomed up to judge of anything relating to design.

The vote on the City By-law asking for an additional $60,000 for the addition to the Winnipeg General Hospital resulted in rather a peculiar manner. The total vote polled was somewhere about 2,000, and out of this number less than 100 voted against. As the law governing a poll of this nature stipulates that ⅔ of the total number of names on the voter's list must be cast the measure was at first thought to be lost on these grounds. The matter has, however, been taken up by the City, and legislation is now being sought whereby the poll can be legalized, as the vote showed that it was only through apathy on the part of the citizens that the by-law was not carried through. The passing of this measure by the Government is now practically settled and work is being proceeded with accordingly.

Nothing definite has yet been decided upon by the Canadian Pacific Railway regarding the projected new Subway, Station Hotel, etc., although work may commence here at any date.

W. PERCY OVER.

THE CANADIAN BUILDING AT THE ST. LOUIS EXPOSITION.

The contract for the erection of Canada's Pavilion has been awarded to John J. Dunnavant & Co., the contract price being $28,000. The building will be 100 feet square, two stories, and surrounded by porticos. The architect is L. Fewings Taylor, of Ottawa, Canada.

The building must be completed by December 1. A permit for its erection has been issued, and Mr. Dunnavant says he will commence work at once.

The Canadian reservation is about half way between the Agricultural Building and the Forestry, Fish and Game Building. The handsome pavilion which is to be Commissioner-General Hutchinson's official home on the World's Fair Grounds next year and which will serve as a club house for Canadian visitors to the Exposition, will stand southwest of and close to the big floral clock on the northern slope of Agricultural Hill. The building will face the avenue which runs north and south in front of the Administration Building and extends to the Agricultural Building.

The National Fire-Proofing Company, of New York, have published a leather bound Catalogue containing many useful tables giving safe loads and illustrating methods of fire-proof construction. The price of the book is $3.00.

Attention is called to the advertisement in this number of the Canadian Casualty & Boiler Insurance Company, whose head office is in Toronto. The managing director of this company, Mr. A. G. C. Dinnick, is a gentleman of ability and large business experience. He has associated with him men having the high standard of technical knowledge requisite for the proper inspection and insurance of boilers, &c.

—THE—

CANADIAN ARCHITECT AND BUILDER

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(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

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NOTES.

The price of bricks in Vancouver has recently been advanced by $2.00 per thousand, the price now being $11.00.

At the Dominion Fair and in fairs throughout the country the Dunlop exhibit of rubber mats, rubber tiling and rubber flooring, was a particularly interesting display for house owners and house builders. The company have introduced many new features both in designs and material. Their new catalogues are now out and are worth investigating.

A DEPARTURE IN HOT AIR HEATING.

Our readers will no doubt be interested in the paper printed in this issue by Dr. George M. Aylsworth, of Collingwood, describing a new method of heating, of which he is the inventor. In Dr. Aylsworth's system hot air is circulated through pipes and specially constructed radiators in the same manner as hot water is employed in hot water heating systems. The system is a distinct departure from the methods at present in use, and on that account alone is interesting. It remains to be seen whether in actual every day practice, it will fulfil the expectations of the inventor. In some rather severe tests which have already been made of the system by the inventor, it is said to have proved satisfactory. We would be pleased to publish the opinions of any of our readers with regard to this system.

WIRING METHODS AND MATERIAL.

We have previously had occasion to call attention to the crying need for improvement in the way in which electrical machinery and wiring is often installed, but the frequency with which cases of criminally careless work come to light, let alone those which at the best are but botchwork, would seem to indicate that the matter is in many cases being entirely lost sight of. As an example we would cite an installation which recently came under our notice in which a 2200 volt line was carried into the basement of a building, no lighter and no dryer than basements usually are, with ordinary weatherproof wire, run on knobs. At several points it had been necessary to insert connectors, parts of which extended to within two or three inches of each other and were not even taped over, notwithstanding that they were within easy reach of anybody passing, being but four or five feet from the floor. Further than this, ordinary lead composition fuse wire, bare, was in use. Compare the above with a proper equipment of rubber wire and enclosed fuses, the former run in conduit and the latter with their necessary connectors and mountings boxed in cabinets, and you will have some idea of its shortcomings. At another installation, a woollen mill, with its usual contents of highly inflammable material occupying all parts of the building, to say nothing of the lint and dust which invariably accompany such processes, there was found the old familiar open lead fuse, some in cutouts with porcelain covers and some without even this slight protection. This meant that the blowing of one of them was almost certain to ignite the pile of material immediately below it, with ultimate results which can easily be imagined. Proper enclosed fuses, installed in cabinets, would have cost but a trifle more and would have made a fire of electrical origin a remote possibility, instead of a large probability. Is it any wonder that when work such as found in the above instances is allowed to be put in, that the uninformed public, and for that matter, many who claim to be well posted, look askance at the proposal to introduce electric power. In the former of these cases the installation was a positive menace to life, and both offered every chance for a severe fire.

NOTES.

Under the direction of the Montreal Industrial Exhibition Association arrangements are being made to hold an important exhibition and fair in the city of Montreal in 1904.

An exhibit of Canadian building stone from the collection of the Geological Survey of Canada, was one of the interesting features of the recent Dominion Exhibition in Toronto.

The Allith Manufacturing Company have leased the building formerly occupied by Leitch & Turnbull at Hamilton, Ont., and will engage in the manufacture of track door hangers and other kinds of hardware.

With the aid of a ginpole, instead of derricks or travellers, for hoisting materials, Chas. T. Caldwell, of Columbus, Ind., is said to have made a record for rapid construction on the St. Louis Fair Grounds. Within fifty days he is said to have completed the Agricultural Building, 1800 feet long by 600 feet wide.

BY THE WAY.

The theory that lightning never strikes twice in the same place has again been disproved. The new municipal buildings, Toronto, the tower of which was partially destroyed by lightning last year, was again struck last month. The damage was but slight, however, only one stone being displaced.

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Notwithstanding loss of commissions as the result of building projects being blocked by recent strikes, some architects whose offices had for months been crowded with work, and who had consequently been compelled to work early and late were disposed to welcome the interruption as affording them opportunity for needed rest. However, a shorter period than three months would have sufficed for this purpose.

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Before the Court of Revision in Toronto the other day an appeal was made by the owners of two of the largest office buildings in the city for a reduction of assessment. One of the reasons urged in behalf of this appeal was that the revenue from these buildings netted the owners only two and one half per cent. on their investment. If this statement be accurate, it must tend to discourage investment in real estate of this character.

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Bow church, to the Rectory of which Mr. Hutton, the late librarian of the National Liberal Club, is being instituted, possesses what Darwinists would call a "survival," says the Westminster Gazette. This is the curious balcony beneath the clock, which represents the medieval tower from which the Court witnessed the tournaments in Cheapside. It was originally a wooden structure, which on one occasion collapsed, so that Queen Philippa and all her ladies "fell with great shame" on the heads of the assembled knights. Jerry building was discouraged in those brave days, and the careless carpenters were ordered to be executed. The royal balcony was last used by Queen Anne in the first year of her reign at a "pageant" devised by the "City Poet," Elkanah Settle.

PERSONAL.

A pioneer builder of Toronto passed away last month in the person of Mr. William Carlyle. The late Mr. Carlyle was a native of Dumfriesshire, Scotland, and had been a resident of Toronto since 1849. He retired from the building business about 20 years ago. He was for many years a member of the city council, and for six years chairman of the board of works.

Professor S. H. Capper, formerly at the head of the Architectural Department of McGill University, is about to commence his duties as Professor of Archaeology and Architecture at Owen's College, Manchester. He was tendered a farewell reception by the officers and members of the Montreal 3rd Field Battery, in which he holds the rank of captain. It is learned that Professor Percy R. Nobbs, of London, England, has been appointed Professor in Architecture at McGill University, in succession to Prof. Capper, and is expected to arrive from England shortly.

NOTES.

A company to be known as the Cement Building Block Company has been organized at Winnipeg to manufacture hollow concrete building blocks.

The new Board of Trade building in Montreal was formally opened last month by Lord Strathcona in the presence of a large gathering of business men. The building was artistically decorated for the occasion.

Mr. J. B. Duffy, of Chicago, recently interviewed the Minister of Customs at Ottawa with the object of endeavoring to have the duty on roofing tile made to correspond with the duty on roofing slate. The existing duty on roofing tile is 35 per cent. ad valorem and on roofing slate 75 cents per 100 square feet.

Canada's annual trade with Belgium amounts to $4,600,000. Among our principal imports from that country are Portland cement to the value of $119,000, window and plate glass, value $586,000, and metal goods $286,270. Our exports include lead, ore, asbestos, lime and other mineral substances to the value of $371,000.

Mr. T. Stirling Lee, a well-known English sculptor, has been engaged to execute twelve figures to be placed above the panels on the principal facade of St. George's Hall, Liverpool. This commission has been given as a step in the direction of the completion of the building. Mr. Lee in a letter to the English architectural journals points out that when this important building was erected, the designer contemplated the use of a number of sculptured symbolical figures, for which places were provided, but the figures have never been supplied. The sculptor urges the gradual completion of the building according to the ideas of the designer, thereby making this the grandest modern building in Europe.

At the recent Fire Protection Congress, held in London, England, the following resolution was adopted : The Congress considers that having regard to the neglect of precautions against damage caused by lightning, the subject should have the serious consideration of the government and local authorities, the technical professions and the fire service. The owners of a building known as Westminster Chambers erected in Copley Square, Boston, Mass., carried the building to a height exceeding the limit prescribed by law for buildings in this locality. After a lengthy legal fight the city has succeeded in getting a verdict against the owners of the building compelling them to reduce the height of the building to the legal limit.

A proposal is before the city council of Montreal for the appointment of a city architect. The argument is advanced in favor of the proposal that by its adoption the city would save money and secure uniformity in the style of its public buildings. The opinions of local architects differ with regard to the matter. Some hold the view that there might be some advantage if the appointment were based on merit alone, and the salary made sufficient to secure the services of a first-class architect. Doubt prevails, however, as to whether either of these essentials would be realized. The reason why better results are not obtained under the present system is said to be that the work does not go to the best architects but to those having the greatest "pull." The suggestion is made that it would pay the city to engage a first-class advisory architect to pass upon all plans for city buildings.

NOTES.

A City Improvement Society has been organized at London, Ont., with the object of improving the appearance of the streets.

A charter has been granted by the Ontario Legislature to the Belleville Portland Cement Company, Limited, capital $2,500,000, to manufacture and deal in Portland cement, bricks, lime, drain tiles, stone and gravel, artificial stone, etc.

Mr. Harry McIntosh, of Point Edward, Ont., has recently invented and patented a machine which is said to be capable of producing the finest quality of pressed brick at the rate of 2,000 per hour. The machine is said to be in operation at Point Edward and Wiarton, Ont.

The new Metropolitan Bank building at corner of Dundas and Arthur streets, Toronto, is attracting attention. The stone used is that manufactured by the Roman Stone Co., Marlborough Avenue, under their patented process, and is certainly all that the company claim for their material.

An artistically gotten up brochure treating of the history, manufacture and characteristics of stained glass, and containing twenty plates showing examples of important works in this line, has been published by Thomas William Camm, The Studio, near Manchester, England. The author is in the front rank of designers and manufacturers of stained glass in England.

A shipment of Canadian clay was recently made from Toronto to England to determine its suitability for the manufacture of pottery. The experiments made with brown clay by experts in the pottery district in England are said to have demonstrated its peculiar value for sanitary ware, owing to the extreme closeness of the grain and its non-absorbent qualities. From another variety of clay vitrified bricks were produced of a durability superior to those made from English clay.

Canadian manufacturers of heating apparatus are finding in the Northwest a profitable market for a large amount of apparatus in this line. The climate is such that more than ordinary attention must be given to heating methods and appliances, while the rapid increase in population is widening the market every year. The prosperous conditions which have prevailed in the Northwest, as well as in every part of Canada, for several years past, have put the people in possession of means with which to make themselves comfortable, and large expenditures are being made for this object. The manufacturers of heating apparatus claim that better prices are obtainable in the Northwest than in Eastern Canada. They also state that, notwithstanding the mildness of the climate in British Columbia, there is a considerable demand for heating appliances in that province. In view of the rapidly widening market, several manufacturing firms are increasing their facilities for the production of this line of goods.

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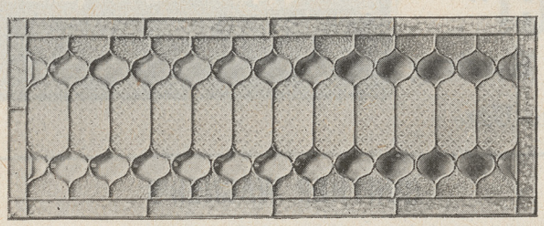

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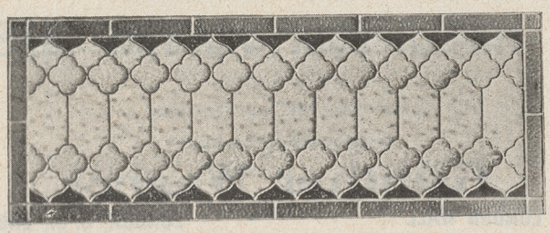

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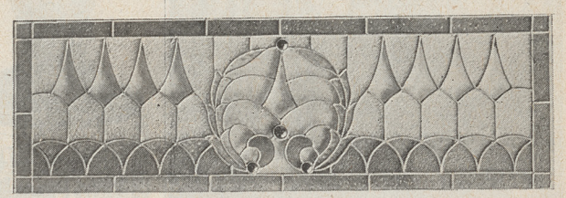

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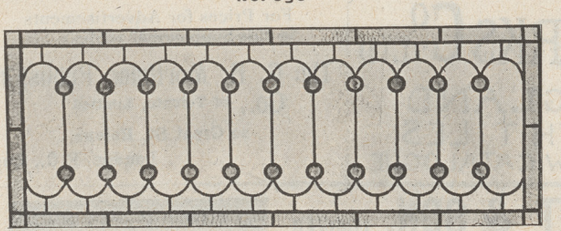

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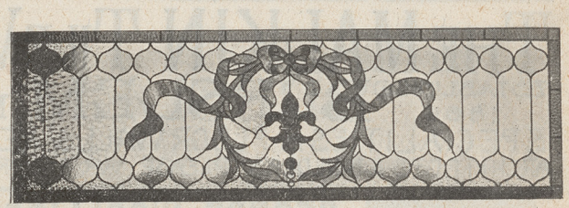

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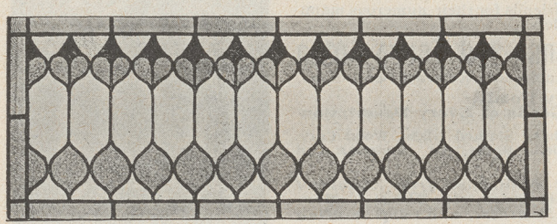

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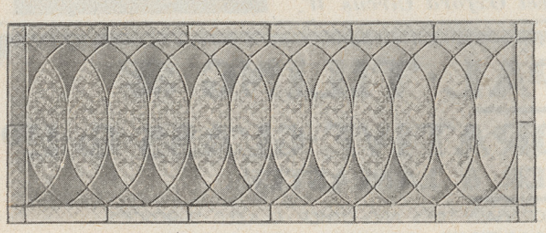

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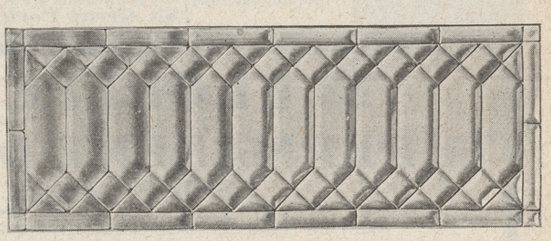

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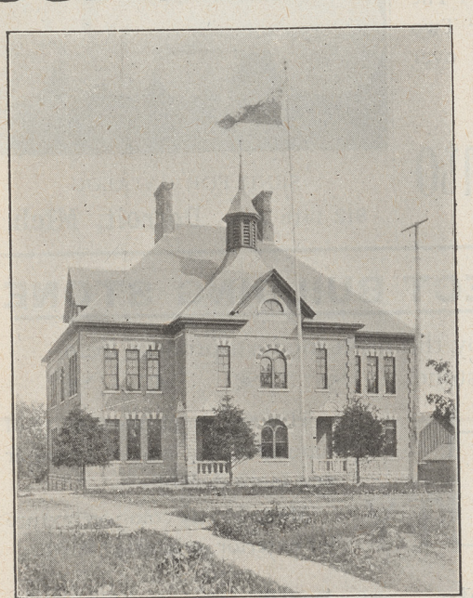

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